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Simulating single-photon sources based on backward-wave spontaneous parametric down-conversion in a periodically poled KTP waveguide

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Abstract

© Published under licence by IOP Publishing Ltd. The properties of the backward-wave spontaneous parametric down-conversion (SPDC) in a periodically poled potassium titanyl phosphate (KTP) waveguide are studied in the context of creating narrowband heralded sources of single-photon states. The effective index of refraction and spatial profile of different waveguide modes, efficiency of different SPDC processes and purity of heralded photons are calculated numerically for a given waveguide. Compared to the usual co-propagating SPDC, spectral narrowing of the backward- wave SPDC was observed as should be expected.

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